



Media Release

The Centre for Australian Weather and Climate Research
A partnership between CSIRO and the Bureau of Meteorology



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Permafrost carbon content double the old estimates

New research indicates that the amount of frozen organic carbon locked away in the world's permafrost regions – a major potential source of atmospheric carbon dioxide (CO₂) and methane (CH₄) – is double what has been previously estimated.

In a paper published in the latest edition of *Bioscience*, an international team of scientists says whereas some of the CO₂ produced as a result of decomposition of previously frozen vegetation would be absorbed by increased, global warming-induced plant growth, it is likely the net effect would be a net increase in atmospheric CO₂.

Involving collaboration between scientists from Australia, Russia, the US, the UK, Canada and Europe the three-year study concluded that accounting for carbon stored deep in the permafrost more than doubles previous high-latitude carbon inventory estimates.

"This is equivalent to twice the current amount of CO₂ in the world's atmosphere," says co-author, CSIRO's Dr Pep Canadell, from The Centre for Australian Weather and Climate Research – a partnership between CSIRO the Australian Bureau of Meteorology.

"With temperatures in the higher latitudes estimated to rise by as much as eight degrees by the end of this century, the world could experience a major melt of large tracts of permafrost in Canada, Russia, Alaska, Norway, Sweden, Finland and Greenland," he says.

"However, accurately predicting the magnitude and effect of thawing permafrost on the world's climate is difficult for several reasons.

"The most important is that current modelling approaches cannot account for the effects on ecosystem dynamics of changing ice into water."

"On a broader scale, while global carbon models may include simple permafrost dynamics they do not adequately represent the transformation of landscapes and organic matter decomposition in thawing permafrost."

Dr Canadell says that despite such limitations, scientists now know that even the release of a small fraction of this vast frozen reservoir of carbon would have a significant impact in accelerating climate change.

"At current rates of warming in high latitudes this is likely to happen," he says.

To read and/or download the paper: *Vulnerability of Permafrost Carbon to Climate Change: Implications for the Global Carbon Cycle*, go to: <http://www.bioone.org/perlserv/?request=get-toc&issn=0006-3568&ct=1>

Image available at: <http://www.scienceimage.csiro.au/mediarelease/mr08-164.html>

Further Information:

Dr Pep Canadell, CSIRO Marine and Atmospheric Research and the Global Carbon Project 02 6246 5631; 0407 068 930; Pep.canadell@csiro.au
Visit the Global Carbon Project website at: www.globalcarbonproject.org

Media Assistance:

Bill Stephens, CSIRO Media Liaison 02 6276 6152; 0408 817 066

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